

The message of the method. Design principles for sustainable ideological communication in the digital classroom.

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Ladies and gentlemen - thank you for being here and taking the time to listen to this presentation.

[] The theme of this conference is: Making digital teaching sustainable. This is not an easy task. What needs to be done? How can digital teaching be made sustainable? How can a contribution to sustainable development be made? How can we, formulated in a more traditional and pedagogical way, contribute to the higher education of humanity?

[] When these questions are asked, it is expressed that current practice does not provide a satisfactory answer. The reality at the moment is at least challenging [] - sustainable design seems uncertain, sustainable development seems questionable and the appearance of a sustainable contribution to the higher education of humanity seems to be pending.

This, ladies and gentlemen, is not beautiful.

The question I would therefore like to ask is: How can a more beautiful, aesthetically convincing design be achieved?

For a researcher like me, this is first of all a research methodological challenge. Which research method is suitable for developing a more beautiful and convincing design of digital media in teaching?

First of all, there are two possibilities: [] In terms of research methodology, empirical studies and research and development projects can be carried out, for example by resorting to approaches of design-based research or design thinking. Or theoretical analyses can be carried out, for example by resorting to social theories or educational theories.

Let's take a look at the first research style, [] empirical research: What happens when working with empirical research methods, with practice research or design-based research? Because with this method, existing practice is taken as a starting point and practice is further developed starting from existing practice, existing practice is continued. This is also shown quite clearly in the pictures with which this method is communicated [] - even if they are probably chosen rather unconsciously. The picture shows: We move in a circle. The practice is not continued in every detail - there are improvements to be expected in any case. But the basic orientation does not change, because the starting point is the existing practice and the question of the basic orientation of the existing practice is excluded. We rotate around ourselves.

Now, however, the existing practice is obviously not satisfactory. If the existing practice is further developed with empirical methods, then it is not bold to assume that the result will be a practice that is not satisfactory in the long term. The data available so far from over 70 years of research [] on teaching with digital media confirms this. That is why the conference call states quite correctly that it is necessary to prove that teaching with digital media is at least as possible as with traditional media. Up to now, the proof has not succeeded. A not necessarily satisfactory result of 70 years of research.

The unsatisfactory result points to a second problem. [] Strictly speaking, the result is actually clear: the thesis has been disproved. A brief look at Popper's critical rationalism reveals, that the rule of critical rationalism is: if the hypothesis is falsified, it must be rejected. [] You surely remember the famous black swan. The hypothesis that teaching with digital media is better or even just as good as with traditional methods has been sustainably falsified over many years. The hypothesis must be discarded.

This has consequences. Popper's argument is based on the classical square of judgement of Aristotelian logic: [] falsification is the conclusion from the falsity of a negative special judgement to the falsity of a positive general judgement. The falsity of a positive general judgement can then be used to conclude the truth of a negative general judgement. If the sentence: "Teaching with digital media is as good as with traditional media" is wrong, it can be concluded that the sentence: "Teaching with digital media is not as good as with traditional media" is correct. This can explain the reservations about digital media in pedagogical practice. If there are disadvantages to be expected - why would anyone do that? Not using digital media in schools is not a defiance of undiscerning practitioners, but a scientifically sound decision.

[] This makes it clear that empirical research methods cannot answer the question of a beautiful and sustainable design of digital media for teaching and learning. So – [] let's take a look at theoretical methods. Allow me to start by playing a little bit with a research method that is not connective here, but pretty disruptive.

[] The starting point is the question of why research on teaching with digital media has been conducted for decades, even though it has long been convincingly proven that it is pointless? What motivates academics, practitioners, politicians and businesspeople to keep pursuing a thesis that has long been disproven? When people do something obviously nonsensical and do not change their behaviour even in the face of repeated experience of failure, this is called a schema in psychology, a habitus in sociology, an ideology in political science and a belief in religious studies.

To me, religion sounds entertaining. [] Let's try to understand the digital doctrine as a religious belief. I assume that you are familiar with the idea of "data religion", which Harari has elaborated in his book Homo Deus. The data religion is justified on the basis that, firstly, Homo Sapiens is losing control and, secondly, [] we are nothing more than the physiological processes in the brain. Humans are limited by limited processing capacities and the troublesome consciousness. This is not the case with computers. [] That is why we should believe in computers and let computers decide what we want to do.

Another keyword that describes the same phenomenon is [] transhumanism. And also in geo-sociology it is assumed that humans and their brains are overtaxed, computers are either already superior to humans or will be superior in the near future and therefore the control of societies should be left to AI systems. We can consider this as different sects of data religion.

A lot of data has to be donated for this to happen, and redemption is promised not only with death, but with the approach of the Singularity. And as so often in history, education and teaching are the areas in which all this is to be developed and prepared. The establishment of digital media and artificial intelligence in the classroom is, in this sense, the implementation of data religion. Schools are no longer to spread the pansophical idea of the secret unified world church, as with Comenius, but the data religion. Schools are being instrumentalised for religious purposes. This is nothing new historically - but it is still not beautiful. It's just not nice when students are indoctrinated with a faith through the back door. But it provides a first explanation for the phenomenon of imposing digital

technologies against scientific evidence. Digital Media can not be wrong, because they represent eternal truth.

Another perspective is [] to understand digital teaching as ideology. You probably know the keyword "Californian ideology". Representatives of the Californian ideology assume that with the integration of all media into digital media and the enforcement of digital media, most of the problems of human societies will be overcome. The problem of democracy, the problem of tolerance, the problem of the environment and the problem of justice are expected to be solved. The peace problem, interestingly, is rarely mentioned. But well – you better do not bite the hand that feeds you. The Californian ideology is an ideology based on cybernetic ideology. This ideology is combined with the demand for a rejection of faith in science. According to the Californian ideology, the spread of digital technology will lead to a return to natural and thus human coexistence. And for such natural and human coexistence, there is no need for states or controls - people are freed from such constraints through the use of digital technologies. The medium of instruction is thus transformed from the means of instruction to the end of instruction. And that's good, since people are developed for the good by the very fact of working with digital technologies.

This point is [] important: The ideology is not about what is done with digital technologies, but that digital technologies are used. This is reminiscent of the still found Catholic conviction that it is not necessary to understand the words when reading the Bible. It is enough to hear the words in order to become partakers of God. So it makes sense to read the Bible in Latin, even if people do not understand Latin.

It is therefore not surprising that the belief that it is enough to use digital media in order to become happy – and happiness is turned into an ideological loaded anchor term with this ideology - can also be traced back to the fact that the Californian ideology is based on esoteric beliefs, usually referred to as the "New Age" movement. [] The world, called Gaia, holds its hand over everything and ensures that everything develops for the good.

This provides a second explanation for the phenomenon that digital technologies are to be imposed even against scientific evidence. The point is to use the technology. Evidence doesn't matter since everything else is done by Gaia and thus runs automatically – a deterministic perspective.

But the Californian ideology has even more to offer: The idea of a better coexistence in Gaia is combined with the idea of a free market.

[] Again, I may assume that you have heard the keyword "capitalist ideology" before. The core thesis of capitalist ideology is that a free market ensures the best provision of goods for all and a fair distribution of goods and wealth in society. To improve human coexistence, it is therefore necessary to minimise state intervention and leave everything to the free play of the market. Crucial to this is the conviction that it is in fact the market that makes the decisions. The market is understood as a kind of living being that regulates everything for the best of people. An argument that is also taken up against all evidence.

But this point is the interface that has allowed the esoteric and the capitalist ideology to be combined into the Californian ideology: For both the market and Gaia are presented as structures that are independent of human beings, that are superior, that only want good and whose will must therefore be followed. This also legitimises the focus in schools on preparation for the labour market. Typical keywords are efficiency, effectiveness and competences. This is emphasised

explicitly in the reports of the PISA consortium and in the 21st Century Skills. Which is not surprising, since both come from the OECD [] – an kind of a holy chair for the market economy.

This provides a third explanation for the use of digital media in teaching against evidence. To: this theoretical perspective reveals that fostering digital media in the classroom amounts to spreading data religion and esoteric capitalist Californian ideology. It is helpful to realise that software is indeed being developed by companies for this purpose, and for schools in particular by the most important sects of the data religion: Microsoft, Apple and Google. And they show that they all believe in the same ideology by the colors of their logos.

So far, it all looks very complex and uncontrollable - and that is precisely how these religions are often legitimised: The world has become over-complex and thus unmanageable. I thus consider this argument as a good starting point for some alternative facts. Let's consider the theses of an overwhelming complexity as fake news.

An easy starter is a look at the premises. [] All the ideologies mentioned are based on two premises. The first premise is that all processes in nature, in humans and in machines can be understood [] as information-processing. This premise was propagated by Norbert Wiener's cybernetic theory. And with this premise, to take just this one example, the assumption that human consciousness could be downloaded into machines is also plausible. The second premise is that the natural state of human coexistence is [] war of all against all. This was propagated by the theory of Thomas Hobbs. And again, the example may suffice that with the premise of war of all against all, the assumption that a market is necessary to force people to cooperate becomes plausible.

But the complexity can be reduced even further: [] Both ideologies are based on monistic premises. All monistic theories assume that there is only [] one cause of action. With this one cause of action, for instance the market or information, everything can be explained. And this cause of action also tells us what should be done, for example how e-learning or living together should be organised. Ethical action then means following the decisions of the cause of action. The idea that one must follow the laws of the market is well known. Critical thinking then means recognising the cause of action as such. So we are free to recognise that we have to follow the laws of the market.

You might consider that beautiful, and there are many people who do. If you also consider that beautiful, then that is the end of the story. The answer to the questions about sustainable design of digital teaching, and about sustainable development, is then: both are achieved by establishing digital media in the classroom. [] Just take the blue pill and you are done.

But if you don't like the idea of choosing not to decide for yourself, then the criticism formulated so far is not the result, but the first step. The first step only serves to enlighten about the problem by drawing attention to the premises. [] The second step is to take the red pill.

If you want to do that, a look at [] dualistic theories is necessary. And don't worry - there is not and has not been anything in any culture of this world that could not be understood as a monistic or dualistic theory; thus far, only exactly these two alternatives have been developed. And two alternatives are really not overwhelming complex. The fact that there are only two alternatives is, of course, quite funny when you're talking about digital media. But I didn't want to jump back to Leibniz in the 17th century, but to Wilhelm von Humboldt in the 18th century.

[] Wilhelm von Humboldt is often portrayed as an educational theorist - but that was not his main occupation. By background, Humboldt was a linguist who was fluent in [] nine languages,

published studies on 25 different languages and formulated an extremely influential theory of language. The premise of his theory of language is not that language shapes human beings - that would be a monistic position with language as the cause of action. Humboldt's premise is that human beings as subjects use language to mediate between [] the world and ideas. He distinguishes between I and world and argues that people use language to mediate between the I and the world.

This is what Humboldt calls the interaction between I and world. Neither a universal mind nor a universal world needs to be assumed with this premise. Both remain unknown. The theory is thus understood by Humboldt himself as incomplete - and this is a characteristic of all dualistic theories. Unlike monistic theories, in dualistic theories the limitations of the theory need to be considered. The reason for this is that dualistic theories are based on the logical figure of performative retorsion. And if you are thinking of Kant's unknown thing-in-itself or Gödel's incompleteness, then you are exactly right - these theories are also dualistic theories that work with the logical figure of performative retorsion.

An essential problem of linguistic research, which occupied Humboldt intensively, is the [] translation problem. The translation problem is the fact that not all words in one language can be translated exactly into another language. The obvious example here is that *Erziehung* cannot be translated as Education, and Education cannot be translated as *Bildung*.

Humboldt studied the problem of translation extensively in his analyses of language and concluded that with each language an own culture is created. These cultures are not closed systems as in cybernetic systems theory, because translations are indeed possible. Languages are therefore always interconnected. However, languages cannot be explained by a common structure or cause. Languages can therefore be related to each other, but at the same time they must necessarily be separated.

Obviously, languages cannot translate themselves into other languages. Languages are not acting entities. Language does not speak. But people can learn several languages, speak several languages and live in different language cultures. [] People can move between languages.

That is crucial. People can move between languages. It is precisely this movement between languages that constitutes *Bildung*. People do *Bildung* by moving between languages. People also do *Bildung* by moving between the self and the world, or by moving between music and sculpture. For Humboldt, *Bildung* is a movement between structures that are inseparably connected and at the same time invincibly separate. Because this always means that people move themselves, the orientation towards action becomes a pedagogical principle. So - *Bildung* is the movement between languages - and this is the core of the concept of *Bildung* in German language.

This understanding of education has a number of interesting consequences. One consequence is that *bildung* cannot be communicated. Because for any communication it is necessary to express what is to be communicated in a language. But you cannot express *bildung* in a language, because having *Bildung* arises in the movement between languages - and that cannot be expressed in a language. *Bildung* cannot be operationalised and measured either, because the measurement has to be done in a language and the movement between languages cannot be captured in a language.

This is the reason why educators always raise their eyebrows when [] digital education is mentioned. Digital education is often used to describe media didactics, without any thought being given to whether these didactics provide a reason for *bildung*. And that digital media can never accomplish precisely this movement between languages is already obvious from the fact that [] the translation problem between computer algorithms does not exist. There are no differences at all for computers that could become an occasion for *Bildung*, and thus *Bildung* cannot be digital.

Moreover, the difference between ego and world does not exist for computers either, because Machine instructions and opcodes are clearly mapped onto each other – no room for interpretations there. It is therefore logically impossible that computers could think, act intelligently or develop consciousness. So – the talk of digital Bildung is at best absurd and at worst amounts to getting people used to being herded around by computers and serve computers. This has hardly anything to do with Bildung.

Bildung is a movement between languages that can be done by people. When people move between languages, they do Bildung. The result of this is that people have Bildung. Bildung means all three: getting bildung, doing bildung and having bildung.

Now - [] Humboldt meant language more generally than it sounds - the German language has been changed in the last centuries, so we have to translate a little. Humboldt did not understand language in a restricted sense. He defined language as more than just [] oral utterances. And language also includes more than [] written communication. Language also includes languages such as the [] architectural language of buildings or the visual language of works of art. Therefore, it seems appropriate to translate language with media.

For all these things are nowadays called media, at least in scientific language. Strictly speaking, this is a broad concept of media, which I like to define like this: [] media are objects that are used by people as signs.

This definition is of course based on dualistic assumptions, and from this dualistic point of view, bildung is a movement between media that can be carried out by people. And when people do that, they do bildung. If they do bildung themselves, they have bildung afterwards. Whether they have bildung can only be decided by the people who do bildung themselves, because any judgement about other people would have to be expressed through the media and thus miss the point.

There is an interesting analogy to the fact that people who do bildung themselves can only decide for themselves whether they are educated. For just as bildung depends on the viewer, [] the beauty of artwork depends on the viewer. Looking at [] one's own bildung is like looking at an artwork. And it is clear that people look at artwork they created themselves with different eyes than at the artwork of others. It is also clear that there is no general definition of beauty - what is considered beautiful can and must be decided by each person. Beauty is in the eye of the beholder. And in the same way, each person can and must decide for themselves whether they have bildung.

This is not a coincidental connection, but can be explained by the fact that [] Wilhelm von Humboldt and Friedrich Schiller had an intensive exchange of ideas in Jena. The reflections that Schiller presented in his famous aesthetic letters where he highlighted the playing human as the real human also became an essential basis of pedagogical thinking along the way. So there is not only an analogy, but definitely a systematic connection between bildung and aesthetic beauty. Therefore, pedagogy is not only about creating occasions for bildung, but about creating beautiful occasions for bildung.

Now it is difficult to reach an understanding about when an occasion for bildung is beautiful. A frequently quoted suggestion by Klafki is to [] focus on the ability to self-determine, the ability to participate and the ability to show solidarity, which is linked to respecting human dignity. Whether this is the case, however, can often only be decided after creating a design. That is why it makes sense to keep human dignity in mind when designing digital media and then to check whether the result of one's own work has accidentally become ugly.

The orientation towards human dignity, the creation of occasions for bildung and the call for doing bildung corresponds to the demands expressed in the recently published Manifesto for Digital Humanism. However, this is not yet sustainable.

With the concept of sustainability, the future is brought into play - and the future is the third pillar of the idea of bildung. Here, too, there are monistic variants. In these variants, future development is seen as known or predictable. The most relevant example here is cybernetic ideology. You know this as a narrative: AI systems know us better than we do and can predict our behaviour - a widespread belief on which cybernetic didactics, behaviourist learning theories and cognitivist learning theories are also based. If you create your design according to these theories, learners are guided by computers towards a fixed goal. In the fixed goal, a known future is expressed, and the computer controls the learning process. It is obvious that people are thus becoming accustomed to being controlled by computers. However, this does not provide a call for bildung.

In the dualistic variant, the assumption is that future development is not known, can not be predicted and thus no explicit goal can be fixed. This variant of sustainable development has been discussed in pedagogy for almost two centuries with the term "future openness". The resulting problem is obvious: What intentions should be pursued in a lesson that prepares for a future that I do not know? The general answer to this question is universal general bildung. General Bildung is the answer to the open future. Humboldt called this the proportionate training of man's powers, and the idea is simple: because we cannot know what a person will need in the future, the best we can do is to make teaching as broad as possible. No focus on talents in early years, but general bildung. The intention is not only to offer movement between different areas as an stimulus for bildung, but above all to enable people to decide for themselves which area they want to develop and deepen in their lives and when. Comenius therefore already conceived of lessons that included carpentry workshops as well as dance halls and lecture rooms. Obviously, you can't do that with digital media. You can not dance with a computer. Additionally, restricting oneself to one or a few media is not a good idea because it closes the future of the learners. What is needed for sustainable development is rather to work with a media ensemble that is as heterogeneous as possible.

Bildung as openness to the future, beautiful acts and self-movement sets the framework for orienting pedagogical work with digital media and achieving a sustainable establishment of digital media. Digital media can be sustainably anchored if occasions for movement between languages are created with a view to an open future, with which the formation of the self is encouraged.

For some suggestions, I would like to distinguish four areas:

The first area is the use of digital media as media. This is usually referred to as media didactics and is a sub area of subject didactic in pedagogy. Here, the content is crucial. Media must be chosen and designed in such a way that they correspond to the content and teaching methods used to achieve the goals with the intention of creating occasions for bildung. Content is based on sciences, and sciences use different research methods. Teaching methods need to follow the research methods. That's why teaching methods can not be copied from one subject to another. What works in informatics is not appropriate for geology or philosophy. Bildung of the individual must therefore be translated for every subject. The goals, contents, methods and media should be chosen in such a way that a contribution is made to bildung. In didactics, this is called content reduction. A well-known suggestion for this is to select exemplary content that represents a subject in an ideal way. The teaching method should then follow the research method on which the subject is based. A classic example of this is experimental physics, which is taught using experiments as the teaching method.

The possibilities of digital media are limited, but quite diverse, because there is a whole range of device-software combinations. And each combination constitutes a medium. This is relevant in view of the openness to the future, because digital devices can be used to work with different types of media such as audio media, moving image media or the written language - and to invite translation between these media. Crucial here is the act of translation as a necessarily self-determined action. Making a digital film out of the text of the Universal Declaration of Human Rights therefore makes more sense than working through multi-watch election questions on the same topic. Making a podcast out of a textbook chapter on the Pythagorean theorem is more meaningful than working through a programmed instruction. And translating a short story into a computer animation makes more sense than memorising the standard textbook interpretation.

The second area is software development. This includes the design of software and the related design of teaching methods. The problem contained therein can be marked with the expression learning management systems - because to manage learning is not what *bildung* is about. What is needed are support systems for *bildung*, and I suspect that the fact that there is no such thing so far is a major obstacle in the sustainable development of digital media in education. A simple example is a feedback system - a term adopted from cybernetics into pedagogy. With a feedback system, evaluations of data generated in educational processes using digital media could be displayed to learners. Showing these evaluations to teachers or heads of schools is usually pointless. And I suspect that this hint alone is enough to make it clear how the development of software in the field of learning analytics should be oriented. Another example is Adaptive Serious Games. In this area, it would be possible, for example, not to let the software configure the adaptivity, but to leave it to the learners to adapt the system to their own needs and thus avoid patronising the learners. I have recently developed this proposal for that.

Something similar applies to all adaptive systems. I have taken the liberty to suggest to support deviant behaviour in this sense, and it was a great pleasure to be involved in building a system that supported deviant behaviour. Unfortunately, the system no longer works, and I learned in the process of developing it that even simple educational tasks are NP hard problems. It is probably this very fact that makes the development of support systems for *bildung* so difficult in practice.

The third area is media literacy education. In the field of media literacy education, there are two main areas: Media criticism and media design. This also requires knowledge about media, which is assigned to media studies and media use. The first area of media criticism, in Baacke's classical definition, is the analysis of problematic social processes. The obvious example of this is what I talked about in the last half hour. The fact that digital technologies are used to spread ideologies is a problematic social process. A media literate person is able to recognise and explain such structures. And the person is able to take this knowledge into account in actions and media design accordingly. It is obvious that something like the OECD's 21st Century Skills are, from this point of view, at best naive and superficial and at worst dangerous and manipulative.

In terms of media literacy education, digital media provide an interesting method for teaching the theory of media reality that is currently being discussed under the heading of fake news. A media reality is the image of reality that is created and consistently presented in a certain media structure. Classic examples are the media realities created in the tabloid press and the quality press. Another example are the media realities presented in commercial and public media. These media realities are easily accessible with digital networked devices in class. This can be used, for example, to ask students to translate a news item from public television into a news item from a commercial newspaper.

In this way, different spheres of truth on which newspaper texts are based can be analysed at the same time. Weber's classic distinction between the religious, economic, political, aesthetic, erotic

and intellectual spheres of truth is helpful for that. It is relevant to experience that a scientific truth that is translated into the political sphere of truth is no longer a scientific truth, but a political truth. Or that a school that is supposed to make a profit is no longer a school, but a company that is concerned with profit and not with bildung.

The fourth area is administration and management. This is certainly the most advanced and relevant area of anchoring digital media in education. And it is the least researched and discussed area. Although this area is the most advanced and a sustainable implementation of digital media has already taken place, the biggest problems seem to exist here - whereby I can only draw on experiences and reports because there is hardly any research yet. Most school management systems, it seems to me, are oriented towards bureaucratic needs. The focus is on the interest in control, monitoring and steering - and not on the interest in bildung, which as such cannot be monitored and controlled. This starts with teachers being degraded to data stereotypists whose main task is to enter data into computer systems. One might almost think that many people believe that teaching will be better if teachers collect more data and therefore teach less. There also seems to be little analysis of this data that is relevant to teachers. I can say this for the administrative systems of the University of Vienna. These systems provide many evaluations, which are used, for example, to describe the course of studies. As far as I can see, the result of the study progression analysis is that students study very differently and their behaviour can therefore hardly be predicted. I was not very surprised by this - in contrast to the surprisingly high price paid for the information. The point is obviously that the system was not developed to support teachers, but to extend the control of teachers by authorities.

Now, it is certainly possible to support teaching in a meaningful way through digital media. For example, the automatic allocation of consultation hours would be very helpful. But that is exactly what does not exist at my university. Beside such small useful tool, it would make sense to have more transparency. Making the university's planning and administrative data accessible to teachers and students, for example, would encourage them to switch between the external view of the university and the internal view within the university. And it is precisely such switches between perspectives and the connected languages that provide occasions for the formation of the self. In this way, administrative systems could also contribute to the sustainable anchoring of digital media in educational processes, and I would be pleased if we could develop corresponding systems together in the coming years.

Thank you so much for your attention. I really look forward to your questions.